

B. V. SKVORTZOV* and Mitsuzo NODA** : **Desmid Flora from a
Sphagnum swamp-lake in the crater of an ancient volcano
Geershuschan of Wutalienchi area, Northern
Manchuria, China**

ビー, ブイ, スクボルツォフ・野田光蔵: 中国東北区北満の五大連池
火口湖のチリモ類

The senior author in 1937 received from A.S. Loukaskin a glass tube with plankton gathered by him and T. Ishiwada in a *Sphagnum* swamp-lake in the crater of an ancient volcano Geershuschan of Wutalienchi area about 70 kil. from Peian, between Peian and Mergen. There is an ancient group of 14 volcanoes, which were in action about 500 years ago. The last registered eruption occurred in 1721—1722. Volcano Geershuschan is about 602 m above the sea level. According to V.N. Jernakov, the lake in an ancient crater is about 100 m long and is overgrown with reeds and *Sphagnum* moss along the shore. As the authors believe these plants have been transferred to the volcano lake by wind and birds.

The desmids from this part of the country never have been studied and on account of the recent condition in Manchuria it is the first chance to be published and the authors propose 38 new species, varieties and forms in the present paper.

Abbreviation: B. D.—West, W. and G. S. West, A Monograph of the British Desmidiaceae 1-4 and Vol. 5. by N. Carter.

Descriptions of the species, varieties and forms

1. **Gonatozygon pilosum** Wolle, B. D. 1: 34 pl. 1 figs. 19-20. Cells about 10 times longer than their diameter, cell-wall covered with fine spines, 0.148 mm long, 0.048 mm broad. (Fig. 1: 1)

2. **Closterium diana**e Ehrenberg, B. D. 1: 130 pl. 15 figs. 1-6.

Our cells are 10-12 times longer than their diameter, strongly curved, cell wall brown; length 0.222-0.333 mm, breadth 0.0225-0.0259 mm, breadth of ends 0.005-0.006 mm. (Fig. 1: 3-5)

3. *Closterium diana*e var. **major** var. nov.

A forma typica dimensione differt; l g. 0.62 mm, lt. 0.029 mm, lt. ap. 0.0037

* Instituto de Botanica, Sao Paulo, Brasil.

** Fac. Sci. Niigata Univ., Niigata, Japan. 新潟市 新潟大学理学部

mm, membrana brunnea. (Fig. 1: 6)

4. *Closterium juncidum* Ralfs, B. D. 1: 128 pl. 14 figs. 10-14.

Our cells elongate, 24-51 times longer than their diameter with brown cell-wall, with striae across the cell; length 0.037-0.111 mm, breadth 0.005-0.0074 mm, breadth of the ends 0.003-0.0037 mm. (Fig. 2: 1-3)

5. *Closterium kützingii* Breb. var. *vittatum* Nordst, B. D. 1: 188 pl. 25 figs. 12-13.

Our cells 20-27 times longer than their diameter, cell wall brown, 6-7 striated; length 0.44-0.518 mm, breadth 0.0148-0.0185 mm, breadth of ap. 0.003 mm. (Fig. 1: 9-10)

6. *Closterium kützingii* var. **constrictum** var. nov.

Semicellulis 32 plo longius quam latius, parte medianis constrictis, membrana brunnea, 4 striatae; lg. 0.0314 mm, lt. 0.0092 mm, lt. ap. 0.0018 mm. A forma typica parte medianae constrictis differt. (Fig. 1: 11)

7. *Closterium ralfsii* Breb. var. *hybridum* Rabenh., B.D. 1: 183 pl. 24 figs. 8-13.

Cells 10 and more times longer than their diameter, curved, inflated in the middle, cell-wall yellowish brown, finely striated; length 0.44-0.592 mm, breadth 0.037-0.044 mm, breadth of ap. 0.006-0.011 mm. (Fig. 2: 4-5)

8. *Closterium venus* Kützing, B. D. 1: 137 pl. 15 figs. 15-20.

Cells small curved, about 6 times longer than their diameter, cell-wall brown; length 0.066 mm, breadth 0.011 mm, breadth of ap. 0.002 mm. (Fig. 1: 14-15)

9. ***Closterium fuscum*** sp. nov.

C. parvum 8 plo longius quam latius, dorso convexo, ventre concavo, polos latos versus sensim attenuatis, obtusis, membrana fusca, delicate striolata; lg. 0.103 mm, lt. 0.012 mm, lt. ap. 0.0037 mm. A *Closterium parvulum* Näg. (B. D. 1: 133-134 pl. 15 figs. 9-10) polos obtusis et membrana fusca et striolatis differt. (Fig. 1: 7-8)

10. *Closterium fuscum* var. **gracile** var. nov.

A forma typica gracilior et dimensione differt; lg. 0.1295 mm, lt. 0.0074 mm, lt. ap. 0.003-0.004 mm. (Fig. 1: 13)

11. ***Closterium vulcanicum*** sp. nov.

Cellulis 10-13 plo longius quam latius, dorso convexo, ventre subrecto, apices versus gradatim attenuatis, polis dilatatis, incrassatis, membrana hyalina et delicato striata; lg. 0.814-0.929 mm, lt. 0.074 mm, lt. ap. 0.015-0.022 mm. A *Closterium*

ralfsii Breb. et var. *hybridum* Rabenh. (B. D. 1: 183 pl. 24 figs. 8-13) cellulis robustior differt. (Fig. 2: 6-9)

12. *Closterium littorale* Gay var. **brunnea** var. nov.

A forma typica (B. D. 1: 155-156 pl. 19 fig. 14) membrana brunnea et dimensione differt; lg. 0.155 mm, lt. 0.025 mm, lt. ap. 0.0057 mm. (Fig. 2: 10-11)

13. *Pleurotaenium capitatum* sp. nov.

Cellulis elongatis, cylindricis, medio modice constrictum, polos versus attenuatis, polis valde dilatis et subcapitatis, tumore basali majore, apice coronula dentim ornato truncatae, membrana glabra, parte inferiore triundulatae; lg. 0.62 mm, lt. 0.037 mm, lt. ap. 0.025 mm. A *Pleurotaenium eugeneum* (Turp.) W. et G. West (B. D. 1: 202) polis valde dilatatis et subcapitatis differt. (Fig. 3: 8-9)

14. *Pleurotaenium capitatum* var. **undulatum** var. nov.

Cellulis lg. 0.544 mm, lt. 0.037-0.04 mm, lt. ap. 0.024 mm, membrana glabra. A forma typica membranae undulatae differt. (Fig 3: 10-11)

15. *Pleurotaenium orientale* Skvortzov var. **pepo** var. nov.

A forma typica dimensione, membranae glabrae, medio non undulatae differt; lg. 0.166-0.24 mm, lt. 0.0296-0.044 mm, lt. ap. 0.0111-0.0165 mm. (Fig 1: 16-17)

16. *Pleurotaenium orientale* var. **subundulatum** var. nov.

Cellulis polos versus attenuatis, apice obtusis, tuberculo nullo, medio modice biundulatum, membrana glabra; lg. 0.296 mm, lt. 0.025 mm, lt. ap. 0.015 mm. A forma typica apicibus attenuatis et dimensione differt. (Fig. 1: 18)

17. *Pleurotaenium truncatum* (Breb.) Näg. var. **asiaticum** var. nov.

Cellulis 11 plo longum quam latum, polos versus attenuatis, polis truncatis, membrana glabra, tuberculatis; lg. 0.355 mm, lt. 0.033 mm, lt. ap. 0.014 mm. A forma typica (B. D. 1: 203-204 pl. 29 figs. 2-3) dimensione et tenuior differt.

18. *Pleurotaenium truncatum* var. **attenuatum** var. nov.

Cellulis lg. 0.4 mm, lt. 0.037 mm, lt. ap. 0.029 mm. A *Pleurotaenium truncatum* var. *farguharsonii* (Roy et Biss.) W. et G. S. West (in B. D. 1: 205 pl. 29 figs. 5-6) membranae glabrae, apicibus attenuatis differt. (Fig. 3: 2)

19. *Pleurotaenium eugenum* (Turp.) West et G. S. West var. **punctatum** var. nov.

Cellulis lg. 0.77 mm, lt. 0.048 mm, lt. ap. 0.029 mm, membrana undulata et punctata. A forma typica (B. D. 1: 202) membranae punctatae differt. (Fig. 3: 15)

20. *Pleurotaenium eugenum* var. **rectum** var. nov.

Cellulis rectis, duplo longum quam latum, medio constrictis, polis tuberculato, membrana glabra; lg. 0.54–0.548 mm, lt. 0.037–0.0407 mm, lt. ap. 0.029–0.033 mm. A forma typica cellula rectis non sinuatis differt. (Fig. 3: 12–13)

21. *Pleurotaenium eugenium* f. *scotica* West et G. S. West, B. D. 1 p. 203 pl. 29 fig. 1.

Our cells about 17 times longer than their diameter, semicells with 4 small undulations about the basal inflation, cell-wall punctate; length 0.592 mm, breadth 0.037 mm, breadth of ends 0.025 mm. Reported from Europe. (Fig. 3: 14)

22. *Pleurotaenium ehrenbergii* (Breb.) De Bary var. **asiaticum** var. nov.

Cellulis polos versus attenuatis, polis truncatis, tuberculatis, medio 4–5 levissime undulato-constrictae, membrana glabra; lg. 0.58–0.888 mm, lt. 0.02–0.04 mm, lt. ap. 0.022–0.0259 mm. A *Pleurotaenium ehrenbergii* var. *undulatum* Schar. (B. D. 1: 207–208) semicellulis medio 4–5 undulatis differt. (Fig. 3: 4–6)

23. *Pleurotaenium ehrenbergii* var. *elongatum* West f. **subglabrum** f. nov.

Cellulis lg. 0.51 mm, lt. 0.022 mm, lt. ap. 0.018 mm. A var. *elongatum* West (B. D. 1: 207 pl. 30 fig. 3) membranae glabrae differt. (Fig. 3: 7)

24. *Pleurotaenium ehrenbergii* f. **glabrum** f. nov.

Cellulis lg. 0.296 mm, lt. 0.0226 mm, lt. ap. 0.014 mm. A forma typica (B. D. 1: 206 pl. 29 figs. 9–11, pl. 30 fig. 1) membranae glabrae differt. (Fig. 3: 3)

25. ***Penium libellula*** (Focke) Nordst. var. **asiaticum** var. nov.

Cellulis lg. 0.166 mm, lt. 0.14 mm, lt. ap. 0.014 mm. A forma *libellula* et var. *intermedium* Roy. et Biss. (B. D. 1: 74 pl. 7 fig. 11) dimensione et latiore differt. (Fig. 1: 2)

26. ***Euastrum pulposum*** sp. nov.

E. parvum, circiter 1.3-plo longius quam latius, profunde constrictum, sinu lineari, extremo ampliatio; semicellulis trilobata, lobis lateribus inferne parallelis in parte mediano concavis apice concavo; membrana glabra, supra et juxta isthmum tumore prominentis; vertice visae subcircularis, medio utrinque tumore magno instructis; lg. 0.0185 mm, lt. 0.013 mm, lt. ist. 0.003 mm. A *Euastrum insulare* (Wittr.) Roy. (B. D. 2: 68 pl. 40 figs. 11–13) semicellulis supra et juxta isthmum tumore prominenti differt. (Fig. 4: 6)

27. ***Euastrum sphagnorum*** sp. nov.

Cellulis 1.3 plo longum quam latum, profunde constrictum, sinu lineari, extremo ampliatio; semicellulis suboblongae vel pyramidato-trapeziformis, 8-lobae, incisuris lateribus semilibus rotundatis, apice convexo cum incisura profunde lata in medio;

membrana granulata, tumoribus 5 granulatis tribus in prope centro lobis superioribus et apice 3-4 granulatis; vertice visae latae ellipticis, medio utrinque tumore magno instructis; lg. 0.0444 mm, lt. 0.029 mm, lt. ist. 0.007 mm. A *Euastrum dubium* Näg. (B. D. 2: 43-44 pl. 38 figs. 5-8) semicellulis 8 lobatae, tumoribus 5 granulatis prope centro differt. (Fig. 4: 3)

28. *Euastrum elegans* (Breb.) Kützing var. **latum** var. nov.

Cellulis circiter 1.4 plo longum quam latum, profunde constrictum, sinu lineari extremo ampliato, semicellulis ovato-pyramidiformibus, apice incisura profunde et lata praeditis; lg. 0.0259 mm, lt. 0.015 mm, lt. ist. 0.0035 mm. A *Euastrum elegans* (Breb.) Kütz. (B. D. 2: 48-49 pl. 38 figs. 16-21) cellulis latioris, apice incisura latis differt. (Fig. 4: 2)

29. **Micrasterias crus-melitensis** (Ehr.) Hass., B. D. 2: 116 pl. 53 figs. 1-2.

Our cells broader than the length, 0.148 mm long, 0.155 mm broad, breadth of ist. 0.0225 mm. (Fig. 4: 5)

30. *Micrasterias tropica* Nordst. var. *polonica* Bacib., Nowe Gatunki Zielenk. fig. 9; Borge, O. Susswasser-Chlorophyceen gesammelt von. Dr. L. Osk. Kihlmann in Nordlichsten Russland, Gouvern. Archangel (1894) p. 34 t. II fig. 41.

Cells large, longer than the breadth, sinus open, semicells 3-lobed, polar lobe spreading retuse, cell-wall covered with little spines; length 0.112 mm, lt. 0.099 mm, ist. 0.015 mm. The type from Brasil (Nordstedt, Brasil 219 t. II fig. 15) and from Eastern India have only one marginal row of little spines. (Fig. 4: 4)

31. **Cosmarium vigentum** sp. nov.

C. minor, 1.2 plo longius quam latius, profunde constrictum, sinu lineari, angustissime, extremo ampliati; semicellulis reniforme-trapezoidiformibus, apicibus semirectangularis, angulis inferioribus, superioribus et basalibus undulatis; membrana apice 4-5 granulata, lateribus utrinque 3 granulata, vertice visae late ellipticis, medio utrinque tumore instructis; lg. 0.0092 mm, lt. 0.007 mm, lt. ist. 0.003 mm. A *Cosmarium sphaerostichum* Nordst. (B. D. 2: 176-177 pl. 81 figs. 12, 14) dimensione, lateribus semicellulis et granulis differt. (Fig. 4: 9)

32. *Cosmarium commisurale* Breb. var. *crassum* Nordst., B. D. 3: 154 pl. 77 figs. 15-16.

Our cells about 1.2 times as broad as long, deeply constricted, semicells subreniform, vertical view elliptical with large granulate protuberance at the middle in each sides; length 0.0295 mm, breadth 0.033 mm, breadth of ist. 0.009 mm. New

to Manchuria, reported from Europe, South America. (Fig. 4: 7-8)

33. **Cosmarium rectinatum** sp. nov.

Cellulis 1.5 plo longius quam latius, profunde constrictum, isthmo angustiori, sinu lineari, extremo ampliato; semicellulis semihexagonali-ellipticis, apicibus et angulis superioribus convexis; membrana glabra, vertice visae ellipticis; lg. 0.037 mm, lt. 0.03 mm, lt. ist. 0.009 mm. A *Cosmarium depressum* Näg. var. *achondrum* (Boltdt.) West et G. S. West (B. D. 2: 177 pl. 62 figs. 6-9) cellulis longum quam latum et isthmo angustiore differt. (Fig. 4: 34-35)

34. *Cosmarium contractum* Kirchn. var. *ellipsoideum* (Elfv.) West and G. S. West, B. D. 2: 172 pl. 61 fig. 28.

Cells about 1.3 times longer than the breadth, very deeply constricted, semicells elliptical, cell-wall punctate; length 0.037 mm, breadth 0.0259 mm, breadth of ist. 0.0074 mm. (Fig. 4: 19)

35. **Cosmarium conglobatum** sp. nov.

Cellulis 1.3-plo longius quam latius, profunde constrictum, sinu aperto, latitudinale, isthmo angustiori; semicellulis semi-ellipticis vel ellipticis, apicibus et angulis inferioribus et superioribus rotundatis; membrana glabra; vertice visae non vidi; chromatophoris longitudinalis; lg. 0.048 mm, lt. 0.029 mm, lt. ist. 0.0074 mm. A *Cosmarium contractum* Kirchn. (B. D. 2: 170-171 pl. 61 figs. 23, 24, 34) chromatophoris longitudinalis 6 differt. (Fig. 4: 18)

36. *Cosmarium angulosum* Breb. var. *concinnum* (Rabenh.) West et G. S. West, B. D. 3: 94 pl. 72 figs. 37-38.

Our cells longer than the breadth, deeply constricted, semicells subquadrate or subrectangular; length 0.0111 mm, breadth 0.0074 mm, breadth of ist. 0.003 mm, thickness 0.0057 mm. (Fig. 4: 33)

37. **Cosmarium wudalienchiensis** sp. nov.

Cellulis 1.4 plo longius quam latius, profunde constrictum, sinu acuto, isthmo angustiori; semicellulis brevi-ellipticis, apicibus et angulis superioribus rotundatis, membrana glabra, vertice visae latae ellipticis, chromatophoris pyrenoidibus singulis praedito; lg. 0.0148 mm, lt. 0.008-0.009 mm, lt. ist. 0.003 mm. Affinis *Cosmarium angulosum* Breb. var. *ellipsoideum* (Elfv.) West et G. S. West (B. D. 2: 172-173 pl. 61 figs. 28-29). (Fig. 4: 32)

38. *Cosmarium orthostichum* Lund var. **minutum** var. nov.

Semicellulis elongato-cylindricis, granulis in series circ. 10 longitudinale disposita ornata; lg. et lt. 0.0148 mm, lt. ist. 0.005 mm. A *Cosmarium orthostichum*

var. *compactum* W. et G. S. West (B. D. **3**: 169 pl. 80 fig. 22) dimensione differt. (Fig. 4: 30-31)

39. *Cosmarium pseudotlanthoideum* West, B. D. **2**: 191 pl. 63 figs. 16-17.

Our cells 1.2 times longer than the breadth, deeply constricted, sinus very narrow, semicells subtriangular; length 0.023 mm, breadth 0.019 mm, breadth of ist. 0.005 mm. (Fig. 4: 20)

40. *Cosmarium adoxum* West et G. S. West, B. D. **3**: 78 pl. 71 fig. 38.

Cells minute, a little longer than the breadth, deeply constricted, sinus linear, semicells truncato-pyramidate, cell-wall smooth; length 0.011 mm, breadth 0.0074 mm, breadth of ist. 0.004 mm. (Fig. 4: 21-22)

41. ***Cosmarium loukaskinii*** sp. nov.

Cellulis tam longum quam latum, profunde constrictum, sinu lineari, extremo ampliato, isthmo mediocre, semicellulis elongato-ellipticis cum apicibus et angulis inferioribus et superioribus convexis, membrana granulata, granulis 12 in seriebus transversalis et longitudinalis dispositis ornata; vertice visae ellipticis, medio utrinque tumore tridentatis instructis; lg. et lt. 0.0296 mm, lt. ist. 0.007 mm. A *Cosmarium punctulatum* Breb. (B. D. **3**: 206-209 pl. 84 figs. 13-14, pl. 102 fig. 22) dimensione granulis 12 non 24 in seriebus transversalibus dispositis differt. Dedicavi hanc speciem in honorum Don. Dr. A. D. Loukaskin. (Fig. 4: 24)

42. *Cosmarium punctulatum* Breb. var. *subpunctulatum* (Nordst.) Borge in B. D. **3**: 209 pl. 86 figs. 15-20.

Our cells about as long as broad; length and breadth 0.0296 mm, breadth of ist. 0.012 mm. Very common. (Fig. 4: 23, 25)

43. *Cosmarium punctulatum* Breb. var. ***asiaticum*** var. nov.

A forma *punctulatum* et var. *subpunctulatum* (Nord.) Borge semicellulis ellipticis apicibus convexis et dimensione differt; lg. 0.037 mm. lt. 0.018-0.0291 mm. lt. ist. 0.0074-0.0092 mm. (Fig. 4: 26-29)

44. ***Cosmarium ishiwadae*** sp. nov.

Cellulis 1.5 plo longius quam latius, profunde constrictum, sinu lineari, extremo ampliato; semicellulis fere orbicularibus, apicibus et angulis superioribus rotundatis, membrana punctata et verrucis obtusis concentrice irregulariter ornatis, vertice visae ellipticis; lg. 0.044-0.059 mm, lt. 0.037-0.044 mm, lt. ist. 0.011-0.015 mm. A *Cosmarium ungerianum* (Näg.) De Bary (B. D. **3**: 195-196 pl. 91 fig. 6) semicellulis fere orbicularibus et non pyramidalis differt. Dedicavi hanc speciem in honorem Don. Dr. T. Ishiwada. (Fig. 4: 13-14)

45. *Cosmarium margaritiferum* Menegh. var. **chinganicum** var. nov.

A *Cosmarium margaritiferum* Menegh. var. *kirchneri* (Borg.) West (B. D. 3: 203 pl. 82 fig. 13) dimensione et semicellulis area centrali laevis differt; lg. 0.055–0.077 mm, lt. 0.05 mm, lt. ist. 0.009–0.0148 mm, crass. 0.033–0.037 mm. (Fig. 4: 15–16)

46. *Cosmarium complanatum* sp. nov.

Cellulis 1.5 plo longius quam latius, profunde constrictum, sinu lineari, extremo ampliato; isthmo angustiori; semicellulis ellipticis, apicibus et angulis inferioribus et superioribus convexis, membrana glabra, vertice visae ellipticis medio utrinque inflatis; lg. 0.0225 mm, lt. 0.0185 mm, lt. ist. 0.003 mm, crass. 0.014 mm. A *Cosmarium subtumidum* Nordst. (B. D. 2: 192 pl. 63 figs. 18, 20) semicellulis angulis inferioribus et superioribus rotundatis, vertice visae medio utrinque inflatis differt. (Fig. 4: 12)

47. *Cosmarium cornutum* sp. nov.

Cellulis tam longum quam latum, profunde constrictum, isthmo angustiori, sinu lineari, extremo ampliato; semicellulis semicircularis, membrana parte superiore semicellularum sparsa granulata; angulis basalibus cum una granula ornata; membrana cetera glabra; vertice visae ellipticis cum polis productis, medio utrinque inflatis, triundulatis, in medio granulis nullis; lg. 0.0296 mm, lt. 0.0259 mm. lt. ist. 0.0074 mm, crass. 0.018 mm. A *Cosmarium antochoundrum* W. et G. S. West (B. D. 3: 193–194 pl. 87 fig. 17) semicellulis parte centralis glabra, vertice visae medio utrinque inflatis differt. (Fig. 4: 17)

48. *Cosmarium granulatum* Breb., B. D. 2: 186 pl. 63 figs. 1–3.

Our cells about 1.4 times as long as broad, cell-wall punctate; length 0.044 mm, breadth 0.025 mm, breadth of ist. 0.0044 mm. (Fig. 4: 11)

49. *Cosmarium lundellii* Delp. var. **minor** var. nov.

A *Cosmarium lundellii* var. *ellipticum* West (B. D. 2: 138 pl. 57 figs. 3–4) dimensione differt; lg. et. lt. 0.0444 mm. lt. ist. 0.0148 mm. crass. 0.0225 mm. (Fig. 4: 10)

50. *Staurostrum extremiorientalis* Skvortzov

Our cells are similar with Harbin specimens. (Fig. 1: 20)

51. *Staurostrum submuticum* sp. nov.

Cellulis parvum, tam longum quam latum, isthmo lato, sinu aperto, semicellulis aversum ellipticis, apicibus, concavis, angulis inferioribus rotundatis; marginibus truncatis ad sinum convergentibus, membrana glabra, vertice visae triangularis,

lateris concavis, angulis obtusis et rotundatis; lg. et lt. 0.0225 mm. lt. ist. 0.005 mm. A *Staurastrum muticum* Breb. (B. D. 4: 133-135 pl. 118 figs. 16-20) semicellulis aversum ellipticis differt. (Fig. 1: 22)

52. *Staurastrum cuspidatum* Breb. ?, B. D. 5: 23 pl. 132 figs. 13-15.

Ventral view triangular, side concave, angulis inflatis, each with a spine; length 0.0296 mm (without spines), with spines 0.0444 mm, breadth of ist. 0.0074 mm. Rare. (Fig. 4: 36)

53. *Staurastrum sebaldi* Reinch. var. *ornatum* Nordst., B. D. 5: 167 pl. 148 fig. 7.

Ventral view triangular, processes long, breadth of the cells 0.037-0.07 mm, breadth of ist. 0.011 mm. Reported from plankton from Europe, Australia and New Zealand. (Fig. 2: 12-13)

54. *Staurastrum dilatatum* Ehrenb., B. D. 4: 172 pl. 126 figs. 10-15.

Ventral view 4-angular, deeply concave, angles rounded, cell-wall granulate; breadth 0.0296 mm, breadth of ist. 0.0074 mm. (Fig. 1: 21)

55. *Staurastrum bifidum* (Ehr.) Breb., B. D. 5: 32 pl. 134 fig. 4.

Ventral view triangular, sides concave, angles bifid, breadth with spines 0.0481 mm, without spines 0.0296 mm, breadth of ist. 0.0129 mm. (Fig. 1: 19)

56. ***Staurastrum bulbiferum*** sp. nov.

Cellulis tam longum quam latum, sinu acuto isthmo lato, apice cum incissura in medio, brachia 2 elongata divergentia sursum curvata, valde dentata, apice 3 aculeata ferentibus, area basali inter brachis et isthmum inflata, area mediana spinosa, vertice visae angulatis apice brachia longa vacua crenata ferentibus; lg. et lt. 0.074 mm, lt. ist. 0.0148 mm. (Fig. 3: 16-17)

57. ***Gymnozyga moniliformis*** Ehr., B. D. 5: 255 pl. 165 figs. 8-9.

Cells barrel-shaped, length 0.022 mm, breadth 0.018 mm. (Fig. 2: 15)

58. ***Sphaerosma dentata*** sp. nov.

Cellulis parvum, tam longum quam latum, filamentis stratum mucosum formantes, profunde constrictum, sinu magna latitudine, introrsum leviter rotundatuto, semicellulis elongatis, lateribus truncatis, mediane incissa, apicibus rectis; lg. et lt. 0.007 mm, lt. ist. 0.003 mm. Affinis *Sphaerosma wallichi* Jacots var. *anglicum* West et G. S. West (B. D. 5: 215 pl. 160 figs. 10-11). (Fig. 2: 16)

59. ***Desmidiium swartzii*** Ag., B. D. 5: 246 pl. 163 figs. 5-8.

Cells united to form twisting filaments, colonies embedded in a thick mucous sheath, vertical view of the cells triangular. (Fig. 2: 17)

60. *Xanthium antilopeum* (Breb.) Kützing var. *laeve* Schmidle, B. D. 4: 68 pl. 109 fig. 3.

Central area glabrous without scrobiculations, length with spines 0.0925 mm, breadth with spines 0.085 mm. Reported from Europe. (Fig. 2: 14)

Summary

The following general feature may be pointed out in connection with the desmids flora found in plankton of a *Sphagnum* swamp-lake in the crater of an ancient volcano Geershuschan of Wutalienchi area, Northern Manchuria:

1. As far as we aware, no previous account of any kind regarding the fresh-water flora of northern part of Manchuria has been published, and the present is the first available data on this point.

2. Desmids from Wutalienchi district were represented by 58 species and varieties, these include 17 new proposed species, 19 new varieties and 2 new forms.

3. Species of genera *Closterium*, *Pleurotaenium* and small forms of *Cosmarium* predominate.

4. Almost all desmids from above district belong to *Sphagnum* bog formation different from a moss bog studied by the senior author from the upper Zeja river of Amur district of USSR in 1917. There the following species have been noticed: *Penium digitus*, *P. spirostiolatum*, *Closterium striolatum*, *C. archerianum*, *C. acutum*, *C. intermedium* var. *ornatum*, *C. parvulum*, *Pleurotaenium trabecula*, *Tetremorus granulata* f. *minor*, *Euastrum bidentatum*, *Micrasterias denticulata*, *Cosmarium nasutum* f. *granulatum*, *C. cyclicum* var. *arcticum*, *C. amurense* and *Staurostrum inflexum*.

5. Only 2 new desmids, *Staurostrum extremiorientalis*, *Pleurotaenium orientale* Skv. var. *pepo* recorded from Wutalienchi previously have been found from a moss swamp near Harbin, in the middle part of Manchuria. Illustrations of Wutalienchi desmids can be useful for future studies.

* * * *

中国東北区北満地帯からの淡水藻の報告は今日までないが、著者等は北満五大連池火口湖のミズゴケ類 (*Sphagnum*) の生育する地帯から得たプランクトン中から 58 種類の Desmids を得たので、これらに就いて記載した。そのうちには 17 新種, 19 新変種, 2 新品種を含んでいる。本稿は東北区(満州)の事情により今日に至って漸く発表する事が出来た。

Illustrations

Fig. 1: 1. *Gonatozygon pilosum*. 2. *Penium libellula* var. *asiatica*. 3-5. *Closterium diana*e. 6. *C. diana*e var. *major*. 7-8. *Closterium fuscum*. 9-10 *C. kützingii* var. *vittatum*. 11. *C. kützingii* var. *constrictum*. 12. *C. ralfsii* var. *hybridum*. 13. *C. fuscum* var. *gracile*. 14-15. *C. venus*. 16-17. *Pleurotaenium orientale* var. *pepo*. 18. *P. orientale* var. *subundulatum*. 19. *Staurastrum bifidum*. 20. *S. extremiorientalis*. 21. *S. dilatatum*. 22. *S. submuticum*.

Fig. 2: 1-3. *Closterium juncidum*. 4-5. *C. ralfsii* var. *hybridum*. 6-9. *C. vulcanicum*. 10-11. *C. littorale* var. *brunnea*. 12-13. *Staurastrum sebalii* var. *ornatum*. 14. *Xanthium antilopeum* var. *laeve*. 15. *Gymnozyga moniliformis*. 16. *Sphaerosoma dentata*. 17. *Desmidium swartzii*.

Fig. 3: 1. *Closterium kützingii* var. *vittatum*. 2. *Pleurotaenium truncatum* var. *attenuatum*. 3. *P. ehrenbergii* f. *glabrum*. 4-6. *P. ehrenbergii* var. *asiatica*. 7. *P. ehrenbergii* var. *elongatum* f. *Subglabrum*. 8-9. *P. capitatum*. 10-11. *P. capitatum* var. *undulatum*. 12-13. *P. eugenium* var. *rectum*. 14. *P. eugenium* f. *scotica*. 15. *P. eugenium* var. *punctatum*. 16-17. *Staurastrum bulbiferum*.

Fig. 4: 1. *Pleurotaenium truncatum* var. *asiaticum*. 2. *Euastrum elegans* var. *latum*. 3. *E. sphagnorum*. 4. *Micrasterias tropica* var. *polonica*. 5. *M. crusmelitensis*. 6. *Euastrum pulposum*. 7-8. *Cosmarium commisurale* var. *crassum*. 9. *C. vigentum*. 10. *C. lundellii* var. *minor*. 11. *C. granulatum*. 12. *C. complanatum*. 13-14. *C. ishiwadae*. 15-16. *C. margaritifera* var. *chinganicum*. 17. *C. cornutum*. 18. *C. conglobatum*. 19. *C. contractum* var. *ellipsoideum*. 20. *C. pseudotilanthoideum*. 21-22. *C. adoxum*. 23 and 25. *C. punctulatum* var. *subpunctulatum*. 24. *C. loukaskinii*. 26-29. *C. punctulatum* var. *asiaticum*. 30-31. *C. orthostichum* var. *minutum*. 32. *C. wudalientiensis*. 33. *C. angulosum* var. *concinnum*. 34-35. *C. rectinatum*. 36. *Staurastrum cuspidatum*.

* * * *

The name of the herbarium where the type specimens are deposited shall be given in the next following paper.

Fig. 1

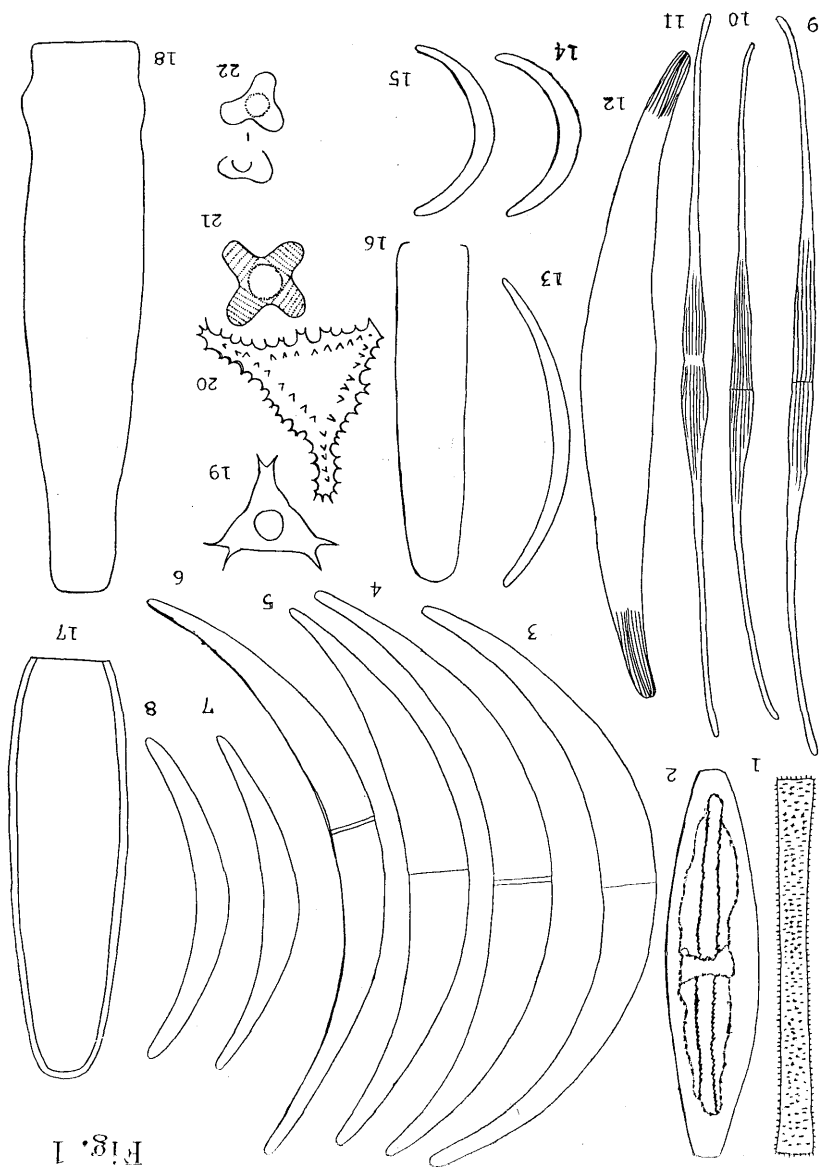


Fig. 2

